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RECYCLING IN SAN FRANCISCO

An Appraisal of Existing Programs and the Options Available
for Promoting Recycling

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for
The Solid Waste Program
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PREFACE

Based in part on guidance and input provided by the Solid Waste Program, I prepared this report as a first step in the formation of a recycling plan for San Francisco. I have tried to tailor the recycling approach and concepts to fit San Francisco's particular situation. This report is not a feasibility study nor a final planning document. It provides an overview for approaching the City's solid waste management problem from a recycling perspective and it outlines, in general terms, a series of follow-on steps and programs that I believe could be undertaken to explore the workability of new recycling options for San Francisco

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INTRODUCTION

Recycling is a concept whose time has come—again. The scavengers of San Francisco were recycling wastes as far back as the early 1900s. And they were among the last companies in the country to give up their historical trash-sorting activities in the face of a solid waste avalanche that accompanied post-World War II productivity.

Today, solid waste management policy is at a crossroads. The current policy is one of disposal—when an item has lost its initial usefulness it is routinely disposed of and the consumer is expected to buy a new one. The usual method of disposal has been to bury the "wastes" in a landfill. A preferable policy is to reuse, repair, and recycle as many objects and resources as possible. Recycling obviously saves resources, but in addition conserves energy and water. For example, it takes less energy and water to make paper from old paper than it does from trees.

Will the old policies of efficient disposal be followed or will we initiate new policies to conserve as many resources as possible? The question is, what things can be recycled and how soon? This report examines the recycling conditions in San Francisco and discusses the City's role in bringing about more recycling activity.

Recycling in San Francisco can be increased. This can best be done in four steps. First, strengthen and publicize existing programs as soon as pos-

sible. Second, initiate a series of pilot projects to determine recycling's full potential. Third, examine the waste stream carefully to determine whether there are new groups of recyclables that could be recovered with new techniques. Fourth, implement the appropriate programs.

This document is divided into two parts. Part One discusses existing programs and evaluates the factors affecting recycling rates. Part Two develops a design process that is geared to the special conditions of San Francisco, and presents a series of recycling policy and program options.

The basic approach of the City is to play the role of facilitator rather than actually be the operator of recycling programs. The City would publicize existing programs, help program operators acquire the equipment they need, and evaluate all administrative procedures that affect recycling activity. The concerns and abilities of scavengers, community groups, commercial interests, and citizens will be coordinated into a broad-based recycling mandate. The City can also assist the expansion and development of marketing opportunities for the salvaged materials.

WHAT IS THE SOLID-WASTE PROBLEM?

On an average day, all the people who live, work, or vacation in San Francisco generate over 2,000 tons of solid wastes. That is about four pounds of wastes for each one of us, from our homes and workplaces, and hundreds of tons from construction and demolition projects. That may not seem like a great deal per person, except that we are dealing with the approximately 900,000 people who live, visit, and work in San Francisco every day.

The recycling of wastes from our homes and cities is not a new activity. What is new at this time is the fact that there are very large amounts of solid wastes from which we can salvage reusable items, material resources, energy, and compost.

These wastes can be divided into three administrative categories, and each one of the three is disposed of differently.

Class I wastes include all hazardous materials that must be disposed of in a State-licensed Class I site. Such sites are monitored very carefully and are equipped to handle dangerous materials. The one closest to San Francisco is in Contra Costa County.

Class II wastes are the most familiar kind, the residential and commercial trash collected by garbage truck. This solid waste category includes the putrescibles such as food wastes and other substances which require daily

disposal to avoid odor and health problems. This mixed waste flow has been going to the Mountain View landfill since 1971.

Class III includes nonputrescible materials such as dirt, concrete, paving debris, and wood. Such material does not have to be disposed of daily and can be used for various fill or reclamation projects. These wastes are taken to a variety of sites that need fill material, as well as to the Class II landfill in Mountain View.

TABLE ONE

SOLID WASTE DISPOSAL FLOW CHART

I HOMES

- A. REPAIRABLES → "GOODWILL" BOXES
- B. RETURNABLES → GROCERY STORES
- C. RECYCLABLES → RECYCLING DEPOTS 6 T/D
- D. MIXED REFUSE →

II OFFICES

- A. MIXED REFUSE →

- B. PAPER → COMMERCIAL
RECYCLING
PROGRAMS

IV STORES

- A. MIXED REFUSE →

- B. CARDBOARD ←

V FACTORIES and SHOPS

- A. RECYCLABLES ←

- B. MIXED REFUSE →

- C. HAZARDOUS WASTE → HAZARDOUS WASTE
DISPOSAL SITE
CLASS I

VI CONSTRUCTION SITES

- A. METAL ←

- B. BRICKS ←

- C. MIXED BUILDING DEBRIS → Class III
1000 T/D

- D. CONCRETE ←

350 T/D

- D. MIXED REFUSE →

VII WATER-QUALITY PLANT

SEWAGE SLUDGE →

VIII SHIPS

MIXED REFUSE →

ROUTE TRUCKS

TRANSFER
STATIONMOUNTAIN
VIEW

CLASS II

1,800 T/D

WHAT IS BEING RECYCLED NOW?

In the past, "recycling" took place even though the term was not commonly used. In the 1950s, for example, West Coast Salvage of San Francisco employed 40 people who recycled many items, even the buttons from the tons of rags they handled. It is quite ironic that this operation was closed in 1969, just as contemporary "recycling" was being started in Berkeley across the Bay. Changes in the economic climate and the solid waste stream led to the closure of such operations as well as that of the sorting historically done by the scavengers in their open trucks. It is likely that, for some materials, changes in today's economy will reestablish recovery as a viable method of managing some of our solid wastes.

Citizen Participation

People in San Francisco have been using recycling depots for many years. There are now two recycling locations open all week long, several open one or two weekends per month, and a few open every weekend (see Appendix p. 77). These depots are operated by community groups and the proceeds from the sale of the recyclables are donated to a host of community organizations and environmental projects.

Newspapers

In addition to dropping off recyclables at these locations, hundreds of peo-

ple throughout the city prepare their newspapers for collection by the scavengers. The newspapers are tied in bundles and put beside the trash on collection day. The scavengers place these bundles in racks on the route truck and later transfer them to a second truck that takes the newspapers received from several collection routes to their yard for shipment to a paper mill. Sunset Scavengers and Golden Gate Disposal report that they recover an average of 22 tons of newspapers each day under present market conditions (the high prices in April, for example, led to a lot of independent scavenging).

Aluminum Cans

For the past few years, Reynolds Aluminum has been operating aluminum buy-back centers in San Francisco. These "centers" consist of a building or a truck equipped with baskets and a scale for weighing the cans. The customer is paid for the cans upon delivery. Reynolds estimates that there are several thousand individuals now recovering 100+ tons of aluminum per month in San Francisco.

Commercial Office Paper

Many companies and public agencies that generate large volumes of waste paper now operate recycling programs focused on the high-value paper grades such as computer printout and tab cards. In some cases the generator will transport the sorted waste papers from his company to a paper dealer who buys them on delivery. There it is weighed, baled, and shipped to market. Alternatively, the generator will sort out the valuable paper and set it aside for a dealer to pick up. If the sorting program is well managed and

large amounts of clean paper are available, the generator will be paid for the paper. If the paper is contaminated or if several recoverable grades are mixed together, the dealer will drop the price or charge the generator for sorting the paper. In addition to possibly being paid for sorted paper, generators can reduce the cost of their trash service substantially by recycling.

Salvage by the Scavengers

In addition to the collection of newspapers tied in bundles from residences, the scavengers also operate special trucks to recover cardboard. A compactor truck is designated to go only to businesses that generate large amounts of cardboard regularly. Cardboard is also salvaged at the transfer station.

Large amounts of paper wastes from the business district, including cardboard, mixed paper wastes, and some high-grade paper, are hauled to West Coast Salvage for recycling. Some of this mixed paper is hand sorted, but most is sold as mixed paper at a reduced price for uses such as roofing.

Additional Recycling Activities

Composting and mulching are practiced now throughout the city. In some cases, this is done by individuals in their own yards and gardens; in others, by commercial gardeners or City departments who chip and spread the material on the landscaped areas they maintain. This practice conserves water and helps maintain fertile soil.

Fats, bones, and grease are collected from restaurants, markets, and institutional kitchens (see Appendix). They are taken to the East Bay or San Jose for rendering and reuse in various products, including grease for export, and various animal feed products, soap, and fertilizer.

Swill, or wet garbage, usually food wastes from restaurants and institutional kitchens, is collected from a few locations. Such wastes are a combination of trimmings, cooked-food wastes, and spoilage. This material is fed to hogs.

Mercury and silver products such as X-ray film, photographic films, and some batteries are recovered for their mercury and silver value. Both metal and paper dealers may deal in such specialty items, which have a low tonnage per month but a very high value per pound.

Concrete and asphalt wastes are now being recycled in large quantities by a new San Francisco business, the Solid Waste Recycling Corporation. This company has opened a plant in Brisbane, adjacent to the transfer station operated by the Sanitary Fill Company on a 50-acre site. The concrete will be used for sub-base material in highway construction, and the asphalt paving can be combined with new paving materials. In addition, the City of San Francisco Public Works Department is developing an asphalt-recycling plant for City projects.

Direct reuse of various materials and objects is practiced by a large cross section of groups. Restaurants sell and give away plastic buckets; lumberyards do the same with some of their wood wastes. BACR (Bay Area Creative

Reuse), a nonprofit community group, collects various cast-off materials for redistribution to schools and day care centers. Goodwill Industries collects and repairs many items.

All of these programs demonstrate the acceptance of recycling. These various activities accomplish numerous economic and community goals and they all conserve resources and provide employment.

TABLE TWO
NONCOMMERCIAL RECYCLING PROGRAMS

Neighborhood Drop-off Programs		
Commodity	Tons/Month ***	Market Value*
Newspaper	95	\$4,750 @ \$50/ton
Glass	70	\$1,400 @ \$20/ton
Tin Cans	10	\$ 300 @ \$30/ton
Cardboard	7	\$ 315 @ \$45/ton
Whole Wine Bottles	6	\$ 360 @ \$60/ton
Aluminum	3	\$1,560 @ 26¢/pound
Other Whole Bottles	1	\$ 70 @ \$70/ton
TOTAL	192	\$8,755**

Note: Volumes were supplied by program operators. These tonnages are included within the volumes which were supplied by the shippers in this area for commercial recycling programs.

Collected by the Scavengers on Their Routes		
Commodity	Tons/Month ***	Market Value*
Newspaper	460	\$23,000 @ \$50/ton
Cardboard	690	\$31,000 @ \$45/ton
TOTAL NONCOMMERCIAL GENERATION	1,342	\$62,755

* These prices are an average of the current price and the average for last year. Prices are currently 40% higher for aluminum and paper. These values are not always realized because the monthly volumes are low and commodities were shipped in small lots.

** Approximately half of these funds are donated to community and environmental groups.

*** Volumes supplied by program operators.

TABLE THREE
COMMERCIAL RECYCLING PROGRAMS

<u>Commodity</u>	<u>Tons Per Month*</u>	<u>Value Per Month**</u>
Corrugated paper	4,000	\$180,000 @ \$ 45/ton
Newspapers	2,500	\$125,000 @ \$ 50/ton
High-grade paper	2,000	\$250,000 @ \$125/ton
Mixed paper	800	\$ 16,000 @ \$ 20/ton
Aluminum	105	\$ 75,000 @ \$720/ton
Grease/suet/bones/swill	<u>Unknown</u>	<u>Unknown</u>
TOTAL	9,405***	\$647,000

* These amounts represent total production in San Francisco. Figures are not yet available on the breakdown between in-house programs, paper brought to dealers, and salvage by the scavengers.

** These prices are an average of the current price and the average for last year.

*** These volumes are estimates gained through conversations with the Bay Area's major paper dealers. They were queried in November 1979. These figures have not been verified. They represent industry estimates provided by several competing dealers as to the total tonnage by grade being moved out of San Francisco. As such, these figures should be the subject of further investigation.

WHAT CONDITIONS AFFECT RECYCLING RATES?

Four major interdependent factors determine how many resources are recycled: market conditions, level of public understanding, disposal methods, and related economic factors. The marketplace is by far the most important. If there is a demand for a large volume and the price offered for that commodity is high, this commodity will be recovered regardless of the other factors. As the market value drops, the other factors have increasing influence on recovery rates.

Market Conditions

The ability of "the market" to consume high volumes of recovered materials is a function of manufacturers' ability to utilize the recycled materials. Thus, the total ability of the manufacturers in a certain industry to make use of recycled materials controls the volume that can be recycled. The amount of recyclable materials that are available in relation to what that particular industry can use controls the price.

If the manufacturers have to bid against one another, as was the case this spring with news on the West Coast, the price is high (\$70 per ton, compared with a normal price of \$20-40) and the recovered volume begins to expand. When more paper is available, relative to what the users need, the price will fall off. Price swings occur through much larger cycles than annual production variations would suggest. This is true because the volumes

recovered are not absolutely related nor immediately responsive to the market price.

The ability of a market to accept much larger quantities of recovered materials than at present depends upon different factors for different materials. For nonferrous metals—particularly aluminum, copper, bronze, lead, and gold—there is no limit on the volume that the market could handle. The price, however, will be a function of the access to, and the cost of, processing raw ores, and of general economic conditions.

When we consider ferrous metals—tin cans and light household metal scraps—we encounter a different problem. For these materials there is an upper volume limit because there are only so many steel-making furnaces and copper ore-enrichment facilities within a reasonable distance that can make use of this kind of scrap. Much of the steel-making industry uses large basic oxygen furnaces rather than the cold-start electric arc process. Therefore small mixed scrap without special processing is unusable in the majority of our major steel-making facilities. However, there are many small regional facilities that make such things as manhole covers, storm grates, and reinforcing steel for concrete construction. They have shown a willingness to experiment with smaller scrap items if certain quality requirements can be met and they are assured of a reliable long-term supply.

The trend toward vertical integration in American industry has in many cases limited the opportunities for development of increased recycling rates. This occurs through a manufacturer owning its own source of supply—a forest or a mine—and then restructuring their processing facilities to use their

own resources. This tends to freeze out recycled materials because there is not an easy way for them to enter such a specialized and integrated operation. In most cases the preliminary processing is done at the mine or the forest where the raw material originates.

Before maximum volume will be recycled in San Francisco, some market development will have to occur for such commodities as light ferrous metals, mixed paper, plastics, and glass. This is true because the local value of less than \$50 per ton is not enough for movement on the international market.

In the past, the secondary-materials industry has only had experience with increasing the prices paid for materials to increase supplies. They could not assume that people would start recycling programs because of increasing resource scarcity. The input of environmental concern and individual responsibility has enlarged the expectations of this industry as to what rates of recovery can be expected from the public.

Public Understanding

The environmental concerns of the past 10 years have established a general awareness about resource scarcity with many of the people of San Francisco. Evidence of this is the people who take part in the newspaper program operated by the scavengers and in the drop-off programs operated by community groups. However, widespread participation will not automatically result from only a general understanding of recycling. People must know what programs are available and how to take part—and they need to know that their

actions are effective.

Recycling practices will not be fully effective in reducing the magnitude of our solid waste problem until people see themselves as actually managing resources through their individual product-purchasing preferences and their recycling activities.

To date, in San Francisco, public understanding of recycling has come mostly from the news media, the commercial recycling programs, the scavengers, and the community groups concerned with resource management. The support for recycling within the schools has been spotty so far, but experience elsewhere indicates that school or classroom campaigns can be very effective.

Disposal Methods

"Out of sight, out of mind" seems to represent an all-too-common attitude regarding garbage disposal. The City's primary responsibility is to ensure that wastes are collected regularly to protect the public health. State law deals with the actual disposal sites, and federal law is concerned with disposal of hazardous wastes and the standardization of some of the State's solid waste regulations.

The aggregate effect of these attitudes and legal requirements has been to provide an efficient system of solid waste disposal, as opposed to resource conservation. At the present time, this entails the storage and collection of mixed wastes; compaction and further mixing in the packer truck; deposit into the pit at the transfer station just across the freeway from Candle-

stick Park; loading with a crawler tractor into a large transfer truck; and daily disposal at the landfill in Mountain View.

Related Economic Factors

Resource scarcity is the most basic related economic factor that affects recycling rates as both demand and price go up. Short-term scarcities have already been discussed under markets. Absolute scarcity can result from raw materials becoming unavailable through ores being depleted, raw-material processing becoming too expensive, or political actions.

Recycling will increase in the face of absolute scarcity. The rate at which it can increase is a function of the compatibility of the recoverable material with the manufacturing facilities that were designed to utilize the dwindling raw materials. In some cases the scarcity problem may well be so serious and possibly of such duration that manufacturing facilities will be converted to accept recycled materials or new plants will be built.

Another factor is that the retailing of products made from recycled materials can be difficult. Consumers are used to certain appearance standards for the items they buy and are slow to accept changes. A good example is the paper sold by Conservatree of San Francisco. The paper is made from 100% recycled paper and the buyers they approach are concerned with the "unusual" soft brown appearance of the paper. It is also available in a bleached white form, but the price is higher and some of the advantages of reducing environmental impacts by recycling are lost. Similar difficulties are also experienced with reclaimed oil, and the increased utilization of

mixed broken glass to make new glass containers. For all these products the consumer tends to be more concerned with appearance than quality.

Additionally, tax policies such as depletion allowances give large financial advantages to major corporations engaged in mining and timber harvesting. The new tax credit for recycling equipment will give some needed equitable treatment to the smaller secondary-materials processors.

It has been charged that shipping rates and rail-car availability have traditionally favored the larger commercial accounts in dealing with raw-materials processors. The National Association of Recycling Industries has long lobbied for an equalization of freight rates for scrap in relation to raw materials.

A factor now receiving headlines is the cost of energy in relation to the cost of labor. This relationship affects what materials can be collected, how far they can be shipped, and then to what extent they can be economically processed. If energy costs outrun labor costs, recycling rates will very likely increase. It is now becoming possible to employ people locally to salvage commodities that are either energy intensive to produce or would be shipped a long distance at a large expense. The recycling of aluminum cans and the recovery of whole bottles for washing and refilling are good examples of this trend.

WHAT RESOURCES REMAIN IN THE WASTE STREAM?

The value of our solid wastes has led many people to speak of our trash as "urban gold." If so, then why isn't this gold being mined now?

There are two main reasons. First, this "urban gold" occurs in small quantities in its pure form. The average family produces approximately 70 pounds of these readily marketable materials per month, with a market value of approximately \$2.15 (see Table Four). Secondly, for these materials to be sold, they must be clean and free of contaminants. This means it is very difficult to harvest such "gold" from the very large volume of mixed waste in an affordable manner and in a manner that will yield a marketable product. Solid wastes can be relegated to three categories of items when considering their potential acceptability for recycling programs.

Disposables

There is a small percentage of items in the waste stream that have a negative value as recyclable material since they cannot be washed, repaired, or refined. This category would include such things as floor sweepings; debris from fires; broken items that are made of molded-together metal and plastic parts; carbon paper; some special-purpose coated papers and mixed packaging; and disposable diapers. This group is generally considered by recyclers to be no larger than one-tenth of the waste stream.

Organics

The next group would comprise all the miscellaneous organics derived from plants and animals which have a potential value when processed into compost and used as soil additives. Certain percentages of organic material are valuable for maintaining a healthy soil community and to conserve water. This would include food wastes and yard and tree trimmings, as well as wood wastes and some mixed paper that is not recyclable as paper. Sewage sludge could also be processed with these organics. This group makes up roughly four-tenths of the waste stream.

Recyclables

The last group of items, which would make up the remaining half of the waste flow, would be all the items and materials that could be recycled if they were separated from the waste flow and if local markets existed. This group includes cardboard and paper, metal items of all kinds, glass containers, and some plastics. Many additional low-volume items such as wooden produce crates, batteries, and used oil are also included in this category.

Group One, the nonusable trash, can be landfilled or burned. Burning offers the chance to recover some heat and ferrous metal from the ashes, but the ashes would have to be landfilled at a special site, and burning may cause a small increase in air pollution.

Group Two, the organic fraction, is now being buried with items from the other groups at the Mountain View landfill.

Recycling ~~all~~ of the remaining Group Three components is a theoretical goal that is probably impossible to achieve from a practical standpoint. This would require gathering up and selling all the cardboard, all the bottles, all the cans, all the newspapers, and dozens of other items. Although recycling them all may be impossible, we *can* greatly improve our recycling rates. Table Five lists practical recovery goals that can be achieved with voluntary programs. An evolution of the in-place voluntary programs could reach those recovery rates in two years. Even higher recovery rates are discussed briefly in Part Two.

It must be remembered that none of these recovery goals are based on programs that have achieved such recovery rates. Modern recycling programs are still in a developmental stage. It has yet to be determined how practical these percentages are for San Francisco.

The volume and composition, and therefore the value of the nonputrescible Class III solid-waste-stream components, are unknown. But such items as bricks, pipe, copper, wooden beams, and in some cases doors and windows, are now being salvaged from demolition projects; wood and miscellaneous metal scraps are being salvaged from new construction.

Class I hazardous wastes can be reused in some cases. There are currently both private and government efforts to help match up the chemical leftovers of one company with the needs of another.

TABLE FOUR
VALUE OF HOUSEHOLD RECYCLABLES

A monthly value of \$2.15 was arrived at by developing an average recyclable-volume-generation number by polling the recycling programs in California that operate home collection programs. Seventy pounds is slightly higher than the average experienced because of the marketability of mixed paper in this region (as in El Cerrito).

<u>Item</u>	<u>Weight, Pounds/Month</u>	<u>Value, Processed & Delivered</u>
Newspaper	33	\$1.16
Mixed Paper	10	.10
Glass	21	.32
Tin Cans	5	.12
Aluminum Cans	<u>1</u>	<u>.45</u>
TOTAL	70	\$2.15

The above values reflect market prices as of January 1980.

TABLE FIVE

COMPOSITION OF WASTE STREAM NOW BEING LANDFILLED

AND ADDITIONAL RECOVERABLE RESOURCES (A)

Composition of the Waste Stream Now Going to Mountain View			Estimated Maximum Recovery Rates with Voluntary Programs (B)			Value (G)	
Material	Percentage	TPD	Recoverable Percentage	Waste Stream (%)	Diverted TPD	Per Ton	Per Day
<u>PAPER</u>							
Newspaper	10	150	40	4.0	60	\$ 50-	\$ 3,000-
Cardboard	9	135	60	5.4	81	45-	3,645-
Office	7	105	30	2.1	31	125-	3,875-
All Other	<u>26</u>	<u>390</u>	<u>(10)</u> (C)	<u>2.6</u>	<u>39</u>	<u>20-</u>	<u>780-</u>
Total Paper	52	780		14.1	211		11,300
<u>ORGANICS</u>							
Food Wastes	5	75					
Yard Trimmings	5	75					
Wood	3	45					
Sewage Sludge (D)							
Total Organics	13	195	(E)				
<u>METAL AND GLASS</u>							
Glass	9	135	(45)	4.1	62	30-	1,860-
Whole Bottles	Trace	-			4	70-	280-
Ferrous	7	105	(45)	3.2	48	30-	1,440-
Aluminum	1	15	70	0.7	11	720-	7,920-
Other Metals	<u>1</u>	<u>15</u>	<u>10</u>	<u>0.1</u>	<u>2</u>	<u>1,000-</u>	<u>2,000-</u>
Total Metal and Glass	18	270		8.1	127		13,500
<u>MISCELLANEOUS</u>							
Plastic	1	15	(10)	0.1	2	200-	400-
Rubber and Leather	1	15					
Textiles	2	30	(30)	0.6	10	50-	500-
All Others	<u>13</u>	<u>195</u>			<u>12</u>		
Total Miscellaneous	17	255		0.7			900
TOTALS	100	1500		22.9% (F)	350		\$25,700

- (A) Does not include materials now being recycled.
- (B) Considerations made when estimating recoverable percentages of marketable commodities in the solid waste now being landfilled:
 1. These figures assume the eventual existence of several Citywide voluntary recycling programs such as expanded drop-off lots, buy-back programs, mini neighborhood drop-offs, and recycling services offered by the scavengers.
 2. The composition of the waste stream in Table Four is a composite of local figures and national averages.
 3. Cardboard was given a 60% figure because it occurs at relatively fewer locations. Newspaper received a 40% figure because the scavengers can easily expand their present program. Office paper received a modest 30% because it is already being recycled to a large extent. New volume will be mostly bond and small high-grade accounts. Mixed waste gets a low percentage because of marketing problems. Glass and ferrous materials received 45% figures because of the lack of existing programs. Aluminum receives a high of 70% because of its high value.
 4. Other metals would include such objects as faucets or broken appliances that would be collected at some drop-off centers.
 5. Plastic is just beginning to move now; there are no organized post-consumer programs yet.
 6. Textiles have a history of recycling and could easily be added as a category at some drop-off recycling lots.
- (C) Brackets indicate materials in which market development would be necessary.
- (D) Sewage sludge is now being generated at the rate of 200 tons per day. This figure will increase as new facilities are built. The City is undertaking a separate disposal planning effort for this commodity.
- (E) Utilization of organics is totally dependent on the development of composting, fermentation, digestion, or combustion techniques.
- (F) This figure plus the 19% of Class II waste now being recycled would yield a total recycling rate of 38% for Class II waste and 25% for waste overall.
- (G) These values are included only for educational purposes. Recycling programs now spend between \$10 and \$80 per ton to obtain, process, deliver, and sometimes collect recyclables. The costs for additional recycling programs will be determined by how efficiently the target material can be aggregated back into a marketable quantity.

WHO COULD INCREASE RECYCLING RATES?

Many people and organizations are in a position to recycle various materials from the waste stream. The following four entities could initiate increased recycling activities, but they presently all face constraints of one kind or another:

- 1) The scavengers. They handle all the trash now, but have developed highly specialized equipment and worker habits geared toward disposal, not salvage.
- 2) The waste generators (customers of the scavengers). They could sell the marketable materials or drop them off at recycling depots rather than putting them in the trash. People either don't know how to do this, or its value, approximately \$2 per month per family, seems too low to justify the special effort. Businesses are concentrating on sales and services, and recycling usually has a low priority.
- 3) Community recycling groups. These groups could expand their programs and publicize them citywide, but they have neither the funds nor the manpower to do so.
- 4) The City. Because the City of San Francisco regulates the solid waste collection and disposal system, the Board of Super-

visors could require any level of sorting and recycling deemed feasible. The scavengers have provided whatever level of service was desired or required to collect the solid wastes at least once a week.

The \$2-per-month-per-family value for recyclables may not seem like very much individually, but for various organizations it could mount up quickly as a fund-raising resource. The City could take steps to make sure that community groups and schools realize this potential. The groups could canvass their members and organize recycling programs focused on reaching specific goals—money for field trips, uniforms, or special projects.

Private Companies

Another major factor should not be overlooked: there is evidence to suggest that private capital is coming into the recycling field at an increasing rate. Several years ago Reynolds Aluminum started the aluminum-can-recycling trend. Weyerhaeuser Paper Company has just opened a facility in San Francisco from which it will initiate office-paper recovery programs. Several small companies now buy whole bottles from recycling centers. And the Solid Waste Recycling Corporation opened a \$1 million facility just to the south of the transfer station in Brisbane to recycle Class III material such as concrete, asphalt, and metal. This company is now evaluating wood and tires.

These activities indicate that some commodities may take care of themselves, so to speak, as economic conditions change. The proper role for the City is

to: (1) make sure that such private investments have every chance of success, (2) inform the citizenry of the existing recycling options and their importance, and (3) facilitate the recovery of additional materials.

WHAT SPECIAL CONDITIONS ARE THERE IN SAN FRANCISCO?

San Francisco is a very diverse and compact large city with a wide range of topographical features. The diversities in San Francisco impacting recycling programs include dwelling types, zoning patterns, street widths and grades, and the cultural diversity of the people living here.

The compactness of the city has one tremendous advantage in that less time and money will be required to take source-separated materials for recycling to processing station(s). On the other hand, a disadvantage of this compactness is that space for the storage of recyclables at the source of generation is very restricted.

The large size of San Francisco's diverse population means that a large continuing program will be required to inform all the people who live, work, and visit here about recycling. The large population justifies the development of a sophisticated recycling program because there is the potential for very large tonnages which will make a program economically attractive.

Another aspect to consider is the identification that residents have with their neighborhoods. In fact, many neighborhood-focused groups are quite active and they could be very helpful in establishing successful recycling programs.

San Francisco possesses a waste-collection characteristic which is unique to

this city. A very large percentage of residential trash customers keep their trash behind a locked door or gate. The scavengers carry about 200 keys per route to gain entry through one or two locked doors to reach the trash and carry it out to the truck. This means that some of the presently available space for recycling is also behind locked doors. Any proposed system must recognize and deal with the present logistics of collection in San Francisco.

There are also some administrative regulations in the Charter which affect how recycling options will be considered. The Charter states that as long as satisfactory service is provided by the existing companies, no new licenses will be issued by the City. This means that the existing scavengers have a lifelong contract with the City. It has also been determined that the Sanitary Fill Company has an exclusive franchise to dispose of the wastes that are brought to the transfer station. The Charter also stipulates that anyone can engage in the collection of materials for salvage (not disposal).

In other respects, such as access to markets, prior recycling exposure, media cooperation, and interest of community groups, San Francisco offers a favorable environment for recycling.

The boundaries of the city and the county are the same, providing a consolidation of authority and planning which should facilitate recycling activities.

SUMMARY AND CONCLUSION

Summary

What is the solid-waste problem?

- Two-thousand-plus (2,000+) tons of solid wastes are being generated in San Francisco every day.
- San Francisco's contract with the major landfill that accepts this material will terminate in 1983.
- This material is now stored, collected, and disposed of in a way that prevents large-scale recycling.
- Markets are not readily available for all the recoverable materials.

What is being recycled now?

- 9,000+ tons of paper per month
- 100 tons of glass per month
- 100 tons of aluminum cans per month

- 10 tons of tin cans per month
- 20 tons of whole bottles per month
- Unknown amounts of:
 - Grease/tallow/swill
 - Compost/mulch
 - Concrete and asphalt
 - Mercury and silver
 - Textiles

What conditions affect the recycling rates?

- Markets
- Disposal methods
- Public understanding
- Related economic factors:
 - Scarcity
 - Consumer acceptance of recycled products
 - Tax policies
 - Shipping rates
 - Labor/energy cost relationships

What resources remain in the waste stream each day?

<u>Recoverable Resources/day</u>	<u>Value/day</u>
60 tons of newspaper	\$ 3,000
81 tons of corrugated paper	3,645
31 tons of office paper	3,875
39 tons of mixed paper	780
4 tons of whole bottles	280
62 tons of glass	1,860
48 tons of ferrous metal	1,440
11 tons of aluminum	7,920
2 tons of mixed metals	2,000
2 tons of plastics	400
<u>10 tons of textiles</u>	<u>500</u>
Total: 350 tons of recyclables/day	\$25,700/day

Who could increase the recycling rates?

- The scavengers
- The waste generators

- The community recycling centers
- The City
- New private business activity

What special conditions are there in San Francisco?

- Very high density
- Wide range of topographical features
- Diversified neighborhoods
- Wide variety of zoning types
- Locked trash-service areas
- Charter provisions that affect recycling programs
- Coterminous city and county

Conclusion

San Francisco is doing very well with paper recovery from commercial sources. This is the only remaining aspect of the extensive salvage operations of the past.

As consciousness of resource scarcity developed in the 1970s, many citizen-operated programs were started. They are relatively small because of the low value of the materials collected and the absence of capital to initiate larger programs. In addition, markets have been limited.

The cost of garbage disposal is increasing and the value of many materials now in that garbage is increasing. As these trends continue, it will become clearer that recycling can and should be increased.

In such a period of changing concerns, costs, and values, it will be difficult to assign the responsibility for recycling to any specific entity. The role of the City would be to make sure valuable resources are recycled if possible, and that the public knows of all existing recycling opportunities. In addition, the City could modify solid waste disposal regulations to stimulate more recycling.

The recycling concept appears to be well established in San Francisco, but there are only limited opportunities for those people who want to take part now. Conditions in San Francisco are somewhat more difficult than those of the average large city, but the City's density holds the promise for a successful recycling program.

PART TWO - HOW CAN RECYCLING BE INCREASED?

AN OVERVIEW

Some recycling is currently taking place. There are two reasons why more materials are not being recycled. First, people may not know of existing programs. Second, the private sector invests its capital in what it perceives to be more profitable areas. Part Two is focused on what San Francisco can do to bring about greater public participation and obtain the funds to reduce the quantities of valuable resources that are now being landfilled.

The City has a role to fulfill because the removal of wastes is a public responsibility. Part Two develops a sequence of tasks that could be undertaken to recover more materials. These tasks are sequential and each one helps prepare the way for the next.

These tasks were arrived at by considering the current situation, listing the relevant administrative considerations, developing a detailed procedure for planning new programs, and finally suggesting specific recycling program activities. These recommendations allow for the option of a relatively active or passive City policy.

The last section examines what a "Best of All Worlds" recycling program would be like. It points out that under the best, and possibly unobtainable conditions, only about half the waste stream could be recycled. The other major portion, largely organic material, can be diverted from the landfill and utilized for energy conversion or possibly transformed into compost. Approximately one fifth or less of the waste stream would still go to a landfill. This would depend on the quality requirements for the recycling

markets as well as which process(es) was chosen to utilize the organic portion.

With a larger City commitment and increased funding more materials can be recycled. But, in the final analysis, recycling can only be accomplished by the people of San Francisco. The investment of funds must be made in relation to the public support that can be achieved.

The Current Situation

The City's long term solid-waste-management policy is now being formulated. The 1983 termination of the landfill contract with the City of Mountain View and the Sanitary Fill Company's plans to build a resource recovery facility have resulted in a discussion of recycling and all other actions that could affect the amount of solid wastes to be eventually disposed of.

Last year the Supervisors passed a resolution that spelled out the conditions under which the Sanitary Fill Company as well as the Chief Administrative Officer are to proceed in providing for solid-waste management in San Francisco. (Appendix p. 71)

Work Completed

As of July 1980 the following tasks related to recycling have been completed:

- 1) A review of all recycling activities in San Francisco.
- 2) The submission of a major grant application to the State Solid Waste Management Board.
- 3) A review of market capacity for additional volumes of materials from San Francisco.
- 4) The formation of an association of all the community recycling groups in San Francisco.
- 5) A preliminary survey to determine which neighborhoods are currently served by the nine existing drop-off recycling depots.

- 6) A trial recycling leaflet program in Bernal Heights.
- 7) The design of a white-office-paper recovery program for City Hall.
- 8) Preliminary planning for a major publicity program for the existing recycling programs.
- 9) Provision of information on request to recyclers and the public concerning the operation of programs and how to recycle at home or at work.

Charter Provisions

There are three provisions in the Charter which impinge on solid-waste planning. On the one hand these provisions tend to restrict the implementation of new recycling procedures, but on the other they have been instrumental in providing San Francisco with excellent garbage service.

The first deals with the issuance of garbage-collection permits. The existing permits will be honored as long as the service provided is satisfactory. In effect, this amounts to a lifetime exclusive contract. Although such a contract provides security for any required investments on the part of the hauler, it also means that the only collection options for garbage ever to be available to the people of San Francisco will be supplied by the present haulers, the Sunset Scavengers and Golden Gate Disposal. The second Charter provision is an exclusive arrangement with the Sanitary Fill Company for disposal of the garbage brought to the transfer station by the permit holders. This means that the only (disposal) options San Francisco has are ones in which Sanitary Fill is involved.

Defect at 10/10 what is 10/10

The third Charter provision states that a permit is not needed for the collection of salvageable material - anyone could start a route for the collection of recyclables. The terms of that collection would be between the collector and the generator/owner of the material. These provisions are important to understanding

the conditions within which increased recycling is being discussed. Further recycling programs are then essentially of two types: first, those that can be pursued privately, and secondly, those that may require Supervisorial or Rate Board actions to carry out.

It may be assumed that as disposal costs increase, energy costs rise, and basic resources become more scarce, what is now considered garbage will become more valuable.) As that happens, its ownership as well as the determination of who will benefit from its use, will become a question of public policy.

Rewrite of County Solid Waste Plan

The ideal time to deal with any questions about the future of solid waste management is when the County Solid Waste Management Plan is rewritten. Coincidentally, San Francisco is now facing a major change in solid waste disposal as a result of the termination of the Mountain View contract; evaluating the role that recycling can play in the future; monitoring the formation of a consortium to build a resource-recovery facility; and preparing to rewrite the County Plan.

In that light, this report could serve two purposes: first, to point out the kind of growth of the existing recycling programs we can expect, and to what extent it can be accelerated by the City; and second, the types of programs we could consider with the appropriate support of the existing companies or if the Supervisors became more involved in policy formation and encouraged new programs. The discussion about such possible options and whether or not to pursue them would become major input in rewriting the County Plan.

Recycling Developments Will Continue

In any case, private recycling programs will continue to develop as the economics become favorable. The most recent example is the Solid Waste Recycling Corporation that is now recycling concrete, asphalt, and metal. This company found a market for a commodity (concrete and asphalt) that could be easily isolated in large tonnages, processed and delivered to a local market (Kaiser Cement).

This plant is located adjacent to the transfer station, and demonstrates the need to allow new ideas and approaches to be incorporated in managing the solid-waste stream. In fact, as mentioned earlier, the Charter allows anyone to pick up materials for salvage, whether bottles for refilling, auto parts for salvage, or paper for recycling.

Tires, wood, and possibly plastics are the next most likely materials to be recycled privately.

The large commercial paper-recycling programs will continue to reflect the market and the quality of the paper available for recovery. The community programs will continue to grow and to accept new materials. They can grow much faster with at least some City-sponsored publicity, and faster still with some help in securing equipment.

ADMINISTRATIVE CONSIDERATIONS

How Will Recycling Be Paid For?

Before considering the program options available to San Francisco, one very important aspect of future program administration should be recognized.

In any case solid waste must be removed from our homes and businesses whether for recycling or disposal. Most solid waste planners believe that recycling must be "economical". That is, recycling can only occur when all the costs of collection, processing, marketing, and shipping can be borne by the value of the recyclables.

Why must this be so?

Historically, the scavengers have charged for collection and sold for additional income as much "trash" as could be salvaged. And, if recycling occurs, resources are saved, environmental impacts at a landfill are avoided, and employment is provided. Assuming for the moment no offsetting of costs from the sale of materials, why not even pay slightly more to accomplish recycling, which has many advantages over a "cheaper" disposal program?

The fact is recycling revenues may actually lower the cost of collection once a full-scale program is in operation and the public knows how to take part. The basic problem facing any planner concerned with recycling new tonnages is, who pays for what services. In San Francisco the basic garbage rate is calculated on the basis of the costs per ton of garbage delivered to the transfer station. Residential rate payers can reduce the service they need and the amount they pay by recycling. *(see page 14)*

Could recycling programs claim a fee for each ton they come to handle which the scavengers once handled? Revamping rate structures can encourage some waste reduction and recycling by individuals with autos. But is it possible to provide similar incentives for recycling programs focused on materials the scavengers are not recovering? Such a "fee" could reflect a reduced investment in disposal facilities. This administrative question does not have to be dealt with before recycling programs can be encouraged

or started, but this question should be recognized and discussed by all those affected by recycling.

Only the most valuable items are routinely recovered, and other items only when their market value is unusually high. In strict economic terms, drop-off recycling is expensive because of the time, gasoline cost, and other expenses involved.

Two Courses of Action

There are basically two levels of effort available to San Francisco, and they are not mutually exclusive. First, the City can continue to assist non-profit community programs to develop. Secondly, the City could begin the process of working with the scavengers to determine what kind of a home-collection recycling program could be added to the existing routes. This course of action may eventually require a more detailed determination of City policy by the Board of Supervisors.

These two courses of action could be initiated simultaneously or they could be implemented according to a planned sequence. If we assumed that recycling interest is very high and markets will not be a problem then they should be started simultaneously. But since we are currently unsure of widespread immediate acceptance and the market outlook is not clear, they should not be started simultaneously.

A series of planning and implementation steps have been determined and the program should not move on to the next one until certain performance criteria have been met for the preceding step. These steps have been designed to accomplish the following program goals.

Program Goals

Immediate program goals

1. Publicize existing recycling programs.
2. Provide new opportunities for all those who want to recycle now.
3. Increase the capabilities of the San Francisco Community Recycling Association.
(The City is now pursuing number 1 and is determining the type of assistance to provide in order to accomplish numbers 2 and 3).

Mid-term program goals

1. Conduct surveys to determine existing levels of recycling knowledge and performance, as well as performance characteristics.
2. Conduct feasibility studies and pilot projects as necessary to determine the design of new programs and equipment.
3. Develop publicity materials and delivery techniques with which to reach groups of people not familiar with recycling.

Long term program goals

1. Determine long term policies.
2. Conduct market development and research projects for all reclaimable commodities as necessary.
3. Determine to what advantage various aspects of implementing recycling programs could be assisted by Bay Region cooperation.

PLANNING NEW PROGRAMS

Materials Being Targeted

Table Six shows the Class II waste stream, how it is being managed now, and where the potential exists for more recycling. Part Two is focused on the

recoverable and reusable portion of the waste stream now being transported to the Mountain View Landfill from our residences, businesses, and workplaces.

All metal items, glass bottles, cans, most plastics, non-coated papers and such additional items as motor oil and textiles can be recycled if they can be gathered and processed into a marketable form.

All garden and yard trimmings, food wastes of all kinds, coated papers and all other miscellaneous paper that is difficult to recycle, wooden items, leather objects etc. can be utilized to create energy or they can be transformed into compost for use by agriculture, horticulture, land reclamation or water conservation projects.

The focus is on these Class II wastes. Class I, hazardous, and Class III, construction wastes and demolition debris can be reused or recycled, but they are not in the scope of this document. Their generation and present management are quite different from the materials now being recycled. Additional reports will be required to evaluate their recycling options.

The basic goal is to develop a sequential set of program options that, if fully executed, maximize the recovery of materials and objects from the residential/commercial waste stream.

Program Design Criteria

- 1) Because of the tremendous diversity of physical and social conditions in San Francisco, a variety of recycling programs should be available.
- 2) The sorting of recyclables at the point of origin (by the generator, with some direct incentive to that generator,) is the preferred approach. This assures quality control and individual knowledge and responsibility, as

well as having control over the resources that were originally purchased by that individual.

3) Because of the lack of storage space at the source, the diversity of social factors, the potential for large recyclable volumes, and the availability of markets, the number of recyclable categories can and should be minimized.

Recycling Program Goals

From a consideration of the special conditions in San Francisco, (see Summary, Part One) the program design criteria that follow from those conditions, and the basic goal of maximizing recycling, the following general recommendations are made. (These recommendations will be incorporated into the recycling program alternatives in the next section).

1) Two Standard Recycling Categories

To standardize future sorting, storage, collection, processing, and marketing procedures for residential route and commercial collection recycling programs, it is recommended that two major categories for recyclables become standard for all but buy-back programs and staffed drop-off sites. This concept will require pilot projects to determine the best way to describe the categories and the best mix of equipment and manual sorting.

Category A-- "Containers"

All glass, metal, and at some point, plastic containers would be collected in a mixed form from restaurants and dwellings. Because these materials possess different properties such as magnetic qualities, lightness, and brittleness they can be separated easily by a combination of mechanical and handsorting operations.

Category B -- "Paper"

All grades of unwaxed papers would be collected together. This would include magazines, chipboard (cereal boxes, etc.), mail, wrapping paper, newspapers, bags, and cardboard. The instructions for this category would include directions to bundle similar kinds of paper together. Magazines should be bundled together newspapers should be tied together, and miscellaneous paper can be stuffed into food boxes.

As recycling volumes increase, these categories could be mixed as mentioned later in the "Best of All Worlds" program. The performance of participants in terms of bundling paper and rinsing out containers will help determine if and when such a total mixing of recyclables is feasible.

2) Establish Buy-Back Programs

The consumer should have the option of selling his cans, bottles, newspapers, household scrap, and metal. The City could facilitate the formation of several multimaterial buy-back programs in San Francisco. These programs would also assist with group fund-raising campaigns.

In addition to recovering resources and returning money to the community, these programs can be very effective in establishing recycling as a credible concept.

3) Expand Drop-off Programs

In some cases individuals or building managers will want to clear a kitchen, garage, or building of recyclable commodities in a short period of time. At the moment, only staffed daytime drop-off depots are available.

For drop-offs to reach their full potential it will be necessary to develop more locations with expanded hours.

Drop-offs will then be of two basic types:

- a) Those staffed and sponsored by a group, where as much sorting as possible is done as the material is dropped off. This assures a high value and the likelihood of the sponsoring group raising funds in this manner.
- b) Unattended drop-offs. These would feature a minimum of sorting at the site, and the value of the materials would pay for their collection, sorting, and processing later at a recycling yard. This processing could be done at one of the multimaterial buy-back stations.

The design and location of such drop-offs has yet to be determined.

4) *Establish Home and Commercial Recycling Services*

There are two basic approaches to this goal:

- a) A scavenger could use the Fully Integrated Source Separation system (see appendix) or some other approach that would allow the utilization of existing equipment. They would be offloaded several times during each route into bins that would be taken to a recycling center.
- b) Alternatively, a second vehicle for recyclables could be operated. It could be operated by the three person garbage crew on collection day or the community recyclers could offer a special collection service. They would pick up recyclables on a call-in basis if a prescribed minimum volume was ready for recycling. Its design would be integrated with the storage containers to be used by the waste generators.

In addition to equipment considerations, the rate base would have to be redesigned to foster recycling and pay for its extra costs, if necessary. Such changes could provide voluntary incentives for recycling or the City could mandate source separation.

TABLE SIX

COMPARISON OF RECOVERY RATES OF FIVE RECYCLING PROGRAMS

PROGRAM	RECOVERY AMOUNT
Existing Drop-off Centers	Currently - 200+ tons per month Potential - 300 tons per month
Expanded Better Equipped Drop-off Centers	
• Increase from 9 to 15 centers Most open weekends only	500 tons per month
• Increase from 9 to 15 centers Most open all week	1000 tons per month
Multi-Material Buy-Back Centers	
• One Location	400 tons per month
• Four locations	1000 tons per month
Residential/Commercial Collection Service	
• Currently (newspaper & cardboard)	1500 tons per month
• On-call Multi-Material Service	1000 tons per month
• Scavenger operated Voluntary Multi-Material Program with Rate Incentives	7000 tons per month
• Mandatory Source Separation	15000+ tons per month

NOTES FOR TABLE SIX

All Projections assume only one program in place at one time. They are preliminary and are for comparison purposes only. The appearance of either buy-back or home collection would displace some of the drop-off volume. A Mandatory program may result in an increased flow to buy-back and drop-off.

Such future trends should be anticipated when designing the ongoing monitoring program as discussed in the following section.

RECOMMENDED RECYCLING PROGRAM

The program will consist of a Home Collection Operation and a Community Operation which can be implemented simultaneously or sequentially in three distinct phases.

PHASE I

The major goals to be achieved in this phase are (1) to determine public support for recycling and (2) to determine the level of support for different methods of recycling.

I. Public Support for Recycling

One indication of public support for a home collection recycling program is the extent to which residents participate in the scavengers newspaper recycling program.

For a more comprehensive gauge of public support, there needs to be a determination of the public current level of knowledge of recycling as well as the level of interest in new recycling programs.

A. Survey

Thus, the first task of this program is to conduct a Base Line Survey of San Francisco residents, and, if funds are available, to include commuters and visitors (conventioners and tourists).

The results of this survey would establish a base which would be used in measuring the success of public education campaigns and resulting participation.

B. Publicity Program

There will be two aspects to the Publicity Program, a general program consisting of public service announcements, garbage bill inserts, posters, etc., and a specific program in a target neighborhood with an established recycling center.

The latter program would be structured in a manner to provide information about the recycling potential in San Francisco.

For example, one month prior to the publicity campaign in the target neighborhood, the residents' level of participation in recycling should be measured. At various intervals during the publicity campaign, which would include door hangers, a letter from the Mayor, presentations to neighborhood groups, etc., the participation rate at the target recycling center would be compared with the participation rate prior to the publicity campaign. The rates of increase would also be compared with the rates of increase in the same time periods with comparable recycling centers where there were no publicity campaigns.

From this analysis, a projection can be made about the growth rate in participation of recycling programs.

Furthermore, the results will also indicate the percentage of people who will recycle as soon as they learn the location of a recycling center and the percentage of people who are not inclined or will not recycle because of the limitations of the existing recycling efforts (e.g. one Saturday a month only drop-off depots).

In addition, an examination of the publicity campaign should indicate those activities which were the most effective and those that had no impact toward increasing participation in recycling.

C. Additional Drop-Off Depots

The establishment of additional drop-off depots and expanded hours at existing depots will be encouraged to give everyone with a car an opportunity to recycle. People will be able to recycle at least once a week within a three mile radius

By monitoring use of the drop-off depots, participation patterns will be ascertained (e.g. those who recycle on the way to work, running errands).

D. Monitoring Procedures

It may be that the recycling program will only go through a few steps and never be completed. However, it is absolutely essential that good monitoring procedures be adopted as if the entire program were to be implemented as rapidly as it would be prudent to do so.

It would be a mistake to invest in or encourage an implementation schedule that does not keep pace with the rate at which the population is learning about and accepting recycling, or worse, to put into place a program that the people would not accept.

Monitoring each activity as it is implemented can give the information needed to proceed in as astute a manner as possible. This must be done as carefully as possible to allow a determination of the city wide program's strong and weak points.

II. Support for Different Methods of Recycling

A. Buy-Back Program

Experience throughout California indicates that a multi-material buy-back recycling program would be very successful in San Francisco. These programs buy back numerous household items, such as faucets and broken tools, bottles, cans and newspapers. Additional items such as motor oil, wood and magazines are also accepted at these programs.

Buy-back programs are operational at various size levels, from one truck to a one acre site with office and warehouse. City assistance could take many forms. The City could provide space for the first year of operation to a program that would eventually be self-sufficient at some other permanent location. Or the City could provide assistance in the form of direct grants of money and/or equipment under a performance contract.

Surveys to those who participate in buy-back programs will reveal the amounts and types of solid waste subflows that can be recovered in this manner. For example, data collected will indicate the amount of glass brought from small restaurants and bars and the amount of newspapers brought from hotels.

In addition, buy-back programs have been very helpful in demonstrating that there is value in trash - that it is more than "just garbage". Thus, publicity about buy back programs will carry the recycling message to new audiences. Its promotional literature should be carefully designed to include the recycling basics as well as the prices.

B. Neighborhood Collection Service

On a pilot basis, a custom pick-up service should be established that will go to any location within the target area and pick up recyclables that have ac-

cumulated to a minimum volume (e.g. a one week supply from about twenty families, a month's supply from four families, a four foot cube of flattened cans, jars, and newspapers, five hundred pounds).

The availability of such a service would be a good measure of the population's level of interest in recycling. By monitoring this program, logistical problems will emerge. Once regular users of this service have been identified, many different storage and handling concepts can be field tested.

From this pilot program, questions such as the following may be answered: Do some buy back customers tend to request pick-up service? Do customers who finally get all the recyclables together for collection then decide to haul them in for cash?

C. Specialty Collection Programs

Two types of specialty programs should be implemented. First, a route should be established to pick up certain items, such as wine bottles for washing and eventually re-use by a firm such as Encore in Emeryville.

Secondly, a distribution service from the recycling depots to a user would be started. For example, metal coat hangers could be brought to cleaners, or large paper bags could be delivered to clothing stores, etc. The programs would focus on re-use rather than recycling which involved re-processing.

These activities will all help build the information base necessary to design a complete recycling program for San Francisco.

D. Participant Interviews

In addition to the surveys and monitoring that will be done repeatedly, it is

necessary to interview a small sample of the participants in each program type. This is done in recognition of the reality that we do not know, at the onset of these programs, the kind of information that we will gather from the development of the programs in Phase I.

PHASE II

The main goals of Phase II are (1) to collect data about San Francisco's garbage and the market for its components, and (2) to design a recycling program for the entire city.

1. Data Correction

A. Subflow analysis of solid waste stream

The composition of all wastes delivered to landfill has been estimated, but there is no good data of the kinds of waste hotels generate in comparison to stores, or apartments, or restaurants. Does most recoverable glass originate in institutional kitchens or restaurants? Would it be possible to establish a ledger paper packer truck or should janitorial companies recycle?

In this subflow analysis, on site surveys/interviews would be conducted with each type of waste generator to determine the potential for organizing a new collection mode or simply informing those with a salable waste flow of that possibility.

In addition, the subflow data will be helpful in developing the specifications for the equipment which will eventually be selected for the recycling program.

This analysis may also show that a toxic or non-desirable component for combustion, such as chlorinated plastics, could be removed at the source by recycling procedures.

B. Market Research

From prior monitoring data and the subflow analysis it will be possible to predict the volume of various materials that can be collected in a citywide program. Market research is necessary to insure that the material can be sold without depressing local prices to the point where the materials would not move.

It may also be necessary to determine existing market capabilities as well as new markets that could be developed for particular recoverable materials. For instance, could an industry be recruited to locate in San Francisco to make use of tires?

The results of the marketing research will determine the kinds of materials and volumes that can be targeted in the program design for recycling.

C. Value of Recycled Materials

The sorting, storage, collection, processing, and marketing of a secondary material are complex. First, the waste generators must be identified, and then a determination must be made regarding the marketability of the recycled materials. Once the subflow ratio is complete, a determination will be made about the manner in which the recyclables would be collected - en masse or separately, depending upon the method that brings the best price.

This analysis will develop the highest value that could be recovered for a particular material.

D. Support Options

Because of the uncertainty about the amount of funds that would be available

for a recycling program in San Francisco, it may be necessary to develop several scenarios to assure that a plan is ready for final development.

The funding picture will, to a large degree, determine the scope of the San Francisco recycling program.

Another possible approach is to redesign the program for known funding sources, and then apply for those funds.

II. Program Design

A. Expanded Recycling Program

From the previous activities, the public's response to a wide range of recycling modes, the characteristics of the waste stream, the manner in which the recycled materials can be used, and the funds available for recycling have all been identified.

This information will be used as the basis for designing an expanded recycling program.

B. Equipment Design and Testing

With all of the pilot programs in operation from Phase I, it should be possible to test new equipment at the various sites. It is essential that equipment and/or logistical problems not be the downfall of a full-scale, citywide recycling program. If there are any problems, they should be in the educational/motivational and/or marketing areas. Therefore, it is important that the equipment chosen be well designed and reliable.

C. Preparation for Implementation

Whenever large numbers of people begin recycling, there is a decline in the

quality of the preparation of the materials to be recycled. People also have many questions. Therefore, unless the program is carefully planned, improperly prepared materials, overwhelming phone calls, frustrated residents and recycling employees may doom the program from the very beginning.

During the opening months, reinforcement and explanation are of the utmost importance. This is the time to develop a sense of momentum and acceptance.

PHASE III

In this last phase, a recycling program will be implemented on a citywide basis. For this step the home collection operation and the community operation require some different activities.

For the community operation, such as the drop-off, buy back, and custom pick-up programs, it is necessary to have all the equipment in place prior to starting a publicity program.

I. Home Collection

For the home collection operation, a four or six month promotion will be needed before the program actually started. Perhaps the most important element of a home collection operation is the worker on the truck. The crews must be willing to help customers take part in a new recycling program.

It is essential that the program start with at least a 20% participation rate, otherwise, the collection crews will only view the recycling aspect of their routine as an awkward aggravation. Survey results of participation rates will be shared with the scavengers, and joint decisions will be made regarding implementation.

II. Community Operation

For the community operation, it is necessary to have all the equipment in place prior to starting a publicity program.

A. New Programs

This may include increasing the number of buy-back facilities, appealing to more groups to take part in recycling fund raisers, and/or acquiring equipment, containers, and trucks for an expanded custom collection service.

B. Publicity

From the experience gained in Phase One and the information gleaned from the activities in Phase Two, a major publicity program should be launched.

C. Long Term Monitoring

A readjustment of monitoring procedures may have to be made. One of the goals of this effort is to determine the reasons which lead people to change their recycling habits (e.g. more options exist). Another goal is to identify the people who still do not recycle and determine their reasons for non-participation.

D. Waste Reduction

Having experienced a variety of recycling activities in the previous two phases, waste reduction can now be explored. A major effort to reduce the amount of waste generated in San Francisco must await the creation of a more knowledgeable public, together with the experiences of the earlier phases.

III. Program Maintenance

A. Publicity

During the early phases, the more important aspects of the recycling program were to publicize the recycling locations and the means of participation. By Phase III, the focus should shift to garnering the attention of those who have not become regular participants in the recycling program. The dimensions of this undertaking will be much clearer after the first two phases have been completed.

In addition, it will be important to publicize the effectiveness of the recycling program to those who do participate.

B. Market Research

It will be necessary to continually search for new marketing opportunities to assure the long term viability of the program. A diversified marketing approach is best. Some portion of each commodity should be exported and sold domestically, predominately in the Bay region.

As the program matures, marketing development becomes the responsibility of the program operators. However, the City can continue to contribute to this effort with trade missions and industrial recruitment.

C. Consumer Education

The recycling concept should be reinforced whenever possible. It is important that it evolves into a basic concept, not simply a trash handling procedure. One means by which this can be accomplished is to educate consumers to the commodities that might possibly be made or sold locally and also

be manufactured from recycled materials. The public should be educated about items that are more easily repaired, reused, and recycled.

Hopefully, recycling habits will eventually affect purchasing decisions in the business community. This may result in a slow, but steady, transition to recyclable materials which would tend to at least stabilize the amount of trash generated by the commercial sector.

WHAT WOULD A "BEST OF ALL WORLDS" RECYCLING PROGRAM LOOK LIKE?

This section describes a maximum effort recycling program, along with the conditions that must exist for the program to be viable. It is important to realize that "the garbage" is actually valuable materials - non-usable and disorganized, but transformable. It would obviously take carpenters much longer to build a home if all the nails, screws, bolts, and lumber were dumped into a large pile rather than being delivered to the job in proper containers and in the proper sequence.

The garbage situation is analogous. Most items in the garbage are made of valuable materials, but items such as magazines, bottles, or cardboard boxes, are worth less than one cent each. It is too expensive to pluck a magazine from the trash here and a bottle there. The pieces need to be organized into piles of magazines and bottles and cardboard boxes. Then they can be recycled.

Thus, "the garbage" should not be viewed as harmful or filthy; rather it is only in a state where the pieces are too small and too mixed to be usable.

In a "Best of All Worlds" program, this difficulty is partially overcome by the people who generate the "waste." They are asked to separate the trash into different categories that can be easily processed.

Required Value Judgments

Before such a program could be established, several value judgments must be considered by the managing authority. These considerations would precede the implementation of a maximum-recovery recycling program. The value judgments are as follows:

1. It is the responsibility of local government to bring about recycling,

not the manufacturers, recycling companies, or higher levels of government.

2. To conserve resources, it is necessary to impose mandatory sorting procedures on all solid waste generators.
3. Since solid wastes must be removed in any case, the cost of a maximum-effort recycling program, minus the revenues from the sale of materials, be borne by the rate payers.

Once the value judgments have been made, special administrative procedures must then be established.

Administrative Considerations

Several recycling programs are already in existence, and it will be necessary to accommodate this present activity into the new program. The current recycling programs are of two types:

Specific - the waste generator recycles particular items.

Salvage - material is salvaged from the waste stream by someone other than the waste generator (i.e. someone who recognizes the value of the material).

To determine the design and costs of the "Best of All Worlds Recycling Program," these volumes, specific and salvaged recyclables, must be identified. To ignore the amount that is currently recycled in computing the costs and revenues of a new program would be a major mistake.

While this recycling program is being designed, it is essential for all parties engaged in specific recycling and salvage operations to become licensed and report tonnages and earnings to the City.

Conditions of Operation

For the implementation and operation of the "Best of All Worlds Recycling Program," several conditions need to exist to assure the program's successful ongoing operation.

These conditions do not currently exist. However, they could exist if a major coordinated effort were made over several years by the public and private sectors to bring them about. This would require the government to take on a role similar to the individual waste generator who sorts his/her recyclables.

The government would have to sort out the existing recycling activities and define a new administrative and managerial policy. This policy would be consistent with the value judgments mentioned earlier, and would have the following conditions as the objectives of such a new policy.

1. Local markets exist for all useful and recoverable materials.
2. The City has complete control over the management and administration of the solid waste stream.
3. All waste generators, residential and commercial, would take part in the program in a prescribed manner, separating solid waste into two categories.

Everyone would need to know the differences among the basic dozen items, and be educated, possibly encouraged or coerced, accordingly. In addition, a major publicity and monitoring program would be required.

Program Description

In keeping with the recommendations of this document, there would eventually

be three basic ways in which any waste generator could participate in the recycling program. The waste generator would not be required to recycle in a particular manner; however, they would not be allowed to leave mixed garbage for collection.

Following are recycling options for all waste generators:

1. Sell source separated materials to a company that recycles them.
2. Donate the materials to a group or person of your choice who will make some use of them.
3. Participate in the "Best of All Worlds" home and commercial collection program that recycles almost everything not handled by the other two program types.

For solid wastes that a generator wants collected at a residence or business, the solid waste must be separated into two categories, recyclables and burnables.

Recyclables include:

Metal items

Containers, glass, metal, plastic

Noncoated papers

Magazines, catalogs, phone books

Cardboard

Boxboard

Burnables include:

Plastic packaging

Coated papers

Food wastes

Metal and plastic molded objects

All soiled paper items

Floor sweepings

Yard clippings

Items in these two categories would most likely be collected at the same time, either with one truck using exterior racks, or the Fully Integrated Source Separation system as described in Appendix p.80, or with the existing collection crew of three people making use of two trucks, one for recyclables and one for burnables.

In the Fully Integrated Source Separation (F.I.S.S.) system source separation of recyclables occurs at the source. They are then placed in strong plastic or paper bags that are placed in the compaction chamber. The bags of recyclables are loaded onto one side of the chamber, and the mixed trash is loaded onto the other side. At the transfer station, the bag contents are separated for further sorting.

The recyclables would be taken to a processing facility to be spread out on a belt for hand and machine sorting.

Ferrous metals would be magnetically separated; paper would be pulled by hand; whole bottles would be pulled by hand and sorted by color and possibly by type for refilling; and the remaining flow of broken glass, aluminum, and plastic containers would be shredded and air classified. There is a possibility that aluminum cans would have to be pulled by hand.

Recyclables

For successful processing of such a large grouping of items, it is important that paper be bundled by type into roughly one-foot-high stacks. One way to accomplish this task is to furnish free, pregummed (water-soluble glue) paper bands to put around, one in each direction, the bundles of magazines, newspapers, or white paper, etc. These paper bands could be distributed through grocery stores or other neighborhood stores.

Once the papers are properly bundled, they would be placed in the recyclable collection container along with all the metal items, cans, bottles, etc. that comprise the recyclable category.

Such a collection container could be a standard garbage can (i.e. those currently used in private homes) or it could be a special bag placed at all the access points to trash chutes in apartment buildings. In the latter situation, building management would be responsible for bringing the full bags down to the trash service area.

Burnables

The burnables would be placed in a separate container which could be a second standard garbage can, or the receptacle now in use at the bottom of the trash chutes in apartment buildings.

Burnables would be taken to a facility, which may or may not be the same location as the recycling facility, for treatment. The burnables may be burned, but they could also be composted, digested, or fermented. All of these processes could accept sewage sludge for treatment.

Composting obviously yields compost, possibly of several types for different uses. Combustion yields heat that can be utilized as process heat in an adjacent or ancillary operation, or it can be used as steam to produce electricity.

Digestion would yield a combustible gas that could be distributed through existing natural gas pipelines, or it could be converted to electricity in a fuel cell. Fermentation will yield a liquid fuel that could be used to make gasahol for City or other vehicles.

Any combination of such treatments could be utilized to meet existing conditions. Combustion would create ash to be landfilled; digestion and fermentation would leave residues valuable for agriculture; and all, including composting, would yield some mixed metal that could be recycled.

Program Performance

Discussion, planning, and educational activities would result in a much greater citywide familiarity with recycling. As a result of such activities, the 9,000 tons per month now being recycled commercially could swell to 15,000 tons per month.

The remaining Class II waste, approximately 34,000 tons (i.e. 40,000 minus the new 6,000 of commercially recovered paper stock), would be handled as follows:

:

5% to 15% of the collected waste stream would go to a landfill. The amount would depend on quality requirements for marketability of the recyclables as well as the treatment used on the burnables. This recycling program would result in about 60% of the waste stream being reused as various materials - paper into paper, glass into bottles, etc. - with the remaining 25% to 35% being converted into compost or energy.

In addition to the recycling program outlined here, additional supplemental programs would be required. These would include an oil recovery program at all gas stations, more Goodwill/Salvation Army-type programs, and perhaps a once-a-year program for appliances, furniture, and other objects too big for the weekly collection program.

APPENDICES

- Board of Supervisors Resolution
- Drop Off Recycling Lots
- Buy Back Recycling Programs
- Companies that Operate Commercial Collection Programs
- The FISS System

AMENDMENT OF THE WHOLE
IN BOARD 9/11/79.

FILE NO 57-79-1

RESOLUTION NO 884-29

1 RESOLUTION AUTHORIZING THE CHIEF ADMINISTRATIVE OFFICER TO NEGOTIATE AN
2 AGREEMENT TO DISPOSE OF THE CITY'S SOLID WASTE AFTER 1983.

3

4 WHEREAS, San Francisco's current contract for refuse disposal with
5 the City of Mountain View, California will expire in 1983; and

6 WHEREAS, The City is therefore facing a serious waste disposal
7 problem and must act quickly to avoid a waste disposal crisis in 1983;
8 and

9 WHEREAS, The City must reduce its reliance on landfilling as the
10 primary method of solid waste disposal and desires to increase the
11 recovery of valuable materials and energy from the waste stream; and

12 WHEREAS, In 1973 the Board of Supervisors passed Resolution No.
13 802-73 which designated the Department of Public Works as the agency
14 with primary responsibility for preparation and coordination of a Solid
15 Waste Management Plan for the City and County of San Francisco; and

16 WHEREAS, In 1974 acting upon the above-mentioned Resolution of the
17 Board, the then Chief Administrative Officer authorized a joint project
18 between the City's two refuse collection companies, Pacific Gas and
19 Electric Company and the Department of Public Works, to investigate
20 the possibility of converting solid waste into some form of energy; and

21 WHEREAS, In September 1978 the Sanitary Fill Company submitted a
22 conceptual proposal for an energy recovery facility for San Francisco's
23 waste at a site adjacent to the existing transfer station in Brisbane;
24 and

25 WHEREAS, The present Chief Administrative Officer organized a re-
26 view of that proposal by City personnel and the best possible solid
27 waste and resource recovery experts to evaluate the technical, environ-
28 mental, and financial information contained in that proposal; and

29 WHEREAS, The Chief Administrative Officer was advised that while
30 the proposed project is technically and economically feasible, it has

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39

1 certain risks. The consultant recommends that the project be con-
2 tracted to a Joint Venture; and

3 WHEREAS, The Chief Administrative Officer's tentative conclusion
4 is that a resource recovery plant should be built by a Joint Venture
5 consisting of Sanitary Fill Company, which has a long and successful
6 history as disposal agent for the City, and one or more other firms
7 satisfactory to the Chief Administrative Officer with substantial re-
8 source recovery experience, financial resources, and dedication to this
9 type of project, and provided that the Chief Administrative Officer is
10 satisfied that the design, construction, operation, and management of
11 the plant will be carried out in a prudent, economic and environment-
12 ally sound manner; and

13 WHEREAS, The preparation and certification of a final environ-
14 mental impact report on the above project will be completed by the
15 City of Brisbane as lead agency, with appropriate input from and
16 cooperation with the City as determined by the Chief Administrative
17 Officer, in consultation with the Office of Environmental Review,
18 Department of City Planning, prior to the time that the Board of
19 Supervisors reviews and takes action on the proposed contracts; now,
20 therefore, be it

21 RESOLVED, That the Chief Administrative Officer is authorized to
22 enter into negotiations with a Joint Venture, as described above, to
23 develop contractual arrangements for disposing of the City's solid
24 waste after 1983. For reasons of economy, efficiency and dispatch,
25 the City prefers to negotiate with Sanitary Fill Company to be a party
26 to this Joint Venture; and be it

27 FURTHER RESOLVED, That the Chief Administrative Officer will
28 establish a long-term Program to manage the City's solid waste. That
29 Program shall allow for all appropriate approaches to solid waste
30 management, including, but not limited to, reduction of waste at the

BOARD OF SUPERVISORS

- 2 -

1 source; separation of waste materials at the source for ultimate
2 re-use; continuing mass collection; processing and separation of
3 materials collected; resource recovery and conversion to energy;
4 sanitary landfill siting and disposal; and other ways of managing
5 waste for purposes of the utmost economy, sanitation, conservation,
6 environmental harmony, and reliability, so that solid waste management
7 will be planned and performed for the greatest practical benefit of
8 the people of San Francisco and of neighboring jurisdictions; and be it

9 FURTHER RESOLVED, That in light of the importance to the City of
10 the proposed resource recovery plant and the proximity of the plant to
11 the City, the Chief Administrative Officer, in consultation with the
12 Office of Environmental Review, Department of City Planning, shall
13 determine that the lead agency preparing the environmental documents
14 for the plant and the participants in the Joint Venture have afforded
15 the City during the environmental impact report process appropriate and

16 ^{11/1/79}
17 ²⁴ ~~meaningful~~ opportunities, as determined by the Chief Administrative
18 Officer, in consultation with the Office of Environmental Review,
19 Department of City Planning, to participate in that process to ensure
20 that the views, concerns, and requirements of the City are reflected
21 accurately and appropriately in the environmental documents to be
22 prepared for the plant, which participation shall, in the discretion
23 of the Chief Administrative Officer, in consultation with the Office
24 of Environmental Review, Department of City Planning, be more substan-
25 tial and direct than that normally afforded to responsible agencies
26 under applicable environmental legislation and regulations; and be it

27 FURTHER RESOLVED, That as part of that Program the Chief Admini-
28 strative Office, on behalf of the City and County of San Francisco, is
29 prepared to negotiate a long-term (minimum 20 years) service contract
30 for disposing of its municipal solid waste; and, be it

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BOARD OF SUPERVISORS

1 FURTHER RESOLVED, That upon completion of all Joint Venture
2 agreements the Chief Administrative Officer is directed to submit the
3 final documents to the Board of Supervisors for approval; and, be it

4 FURTHER RESOLVED, That in order to safeguard the City's rate
5 payers against financial and technical risks which are outside their
6 control, the resulting agreement for the design, construction, and
7 operation of an energy recovery facility, if one is approved by the
8 Board of Supervisors, shall conform to the following principles:

9 1. The Joint Venture shall demonstrate that it has expertise,
10 experience, and financial strength to insure the project's tech-
11 nical and economic viability. One member corporation of the
12 Joint Venture shall have expertise in the design and construc-
13 tion of large refuse derived fuel plants (with rated capacity in
14 excess of seven hundred fifty (750) tons per day.) Among the
15 criteria for assessing the qualifications of the Joint Venture
16 will be its financial capacity and its capability to assume
17 significant technical and economic project risks. The Chief
18 Administrative Officer shall have the right to reject the
19 proposed Joint Venture.

20 2. Development of a resource recovery project has significant
21 technical and economic risks associated with it. The Joint Ven-
22 ture will be expected to assume those risks which are reasonably
23 under its control by guaranteeing a disposal price and the per-
24 formance of its system. The City is willing to share those risks
25 that are outside the reasonable control of the Joint Venture. In
26 all cases appropriate benefit will accompany the acceptance of
27 risk.

28 3. The City will assure that an adequate amount of solid waste
29 will be delivered to the resource recovery plant. ✓
30

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BOARD OF SUPERVISORS

1 4. The Joint Venture will guarantee to annually process stipu-
2 lated amounts of solid waste; annually produce stipulated amounts
3 of energy; and annually dispose in landfill stipulated amounts of
4 residue from the project. These activities shall conform to all
5 applicable environmental requirements.

6 5. The City shall share responsibility with the Joint Venture
7 for securing suitable sites for the project and solid waste
8 residue disposal.

9 6. The City shall assist the Joint Venture with the acquisition
10 of necessary permits required by the project.

11 7. The Chief Administrative Officer and the Joint Venture will
12 develop a detailed financing plan for the project. The Chief
13 Administrative Officer will participate in the project's financial
14 structuring and financial implementation.

15 8. Consistent with City policy as stated in Section 12.8 of the
16 Administrative Code, the Joint Venture shall develop an Affirma-
17 tive Action plan, with special consideration for women,
18 minorities, and minority-owned businesses, that will be imple-
19 mented throughout design, construction, and operation of the
20 project.

21 9. It shall be the responsibility of the Chief Administrative
22 Officer and the Joint Venture to encourage, organize, and obtain
23 citizen advice and participation in the Program's policies and
24 development, as may be required by law or as may be deemed appro-
25 priate or desirable by the Chief Administrative Officer. This shall
26 include the responsibility of the Chief Administrative Officer to
27 establish a Citizens Advisory Committee.

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28 10. The City prefers an agreed-to price per ton for disposal of
29 its delivered solid waste with an associated fixed rate to home-
30 owners. The City will consider upward adjustments to this rate
31 based on agreed-to conditions. The City will share in revenues
32 from energy and material sales in a manner consistent with its
33 assumed risks.

BOARD OF SUPERVISORS

1 11. The City intends to enter into such an agreement only if the
2 price offered by the Joint Venture is competitive with other dis-
3 posal alternatives available to the City; and, be it
4
5 FURTHER RESOLVED, That the Chief Administrative Officer is
6 directed to concurrently identify and analyze alternative landfill
7 sites that can potentially be used to dispose of San Francisco's waste
8 as a basis for comparing the cost of alternative disposal methods and
9 to serve as a back-up disposal alternative; and, be it
10
11 FURTHER RESOLVED, That the Chief Administrative Officer will pro-
12 vide progress reports to the Board of Supervisors.
13
14

Adopted—Board of Supervisors, San Francisco..... SEP 11 1979
Ayes: Supervisors Britt, Dolsan, Gonzales, Horanzy, Hutch, Kopp, Lau, Molinari, Pelosi, Renne, Silver.
~~Absent Supervisors~~.....
~~Absent Supervisors~~.....

I hereby certify that the foregoing resolution was adopted by the
Board of Supervisors of the City and County of San Francisco.

57-79-1 SEP 14 1979
File No. Approved
ACTING Clerk
Mayor

DROP-OFF RECYCLING LOTS

<u>Sponsoring Groups</u>	<u>Yrs. in Operation</u>	<u>Location</u>	<u>Hours Open</u>	<u>Commodities</u>
Richmond Environment Action	10	On Anza, blk west of Masonic	Six days a week	All glass containers Newspapers Aluminum cans Steel cans Cardboard Computer printout and tab cards Goodwill objects Mercury batteries
McAteer High School	9	At McAteer High School Portola & O'Shaughnessey	1st Saturday 9-12:00 noon	As above, no CDBD
Pollution Solution	8	41st Ave. & Quintana	3rd Sat. only 9 - 2	No NWS, CDBD or GDWL (news is done by another group)
Haight Ashbury Neighborhood Council	6	Kezar Stadium, West End	Saturdays, 9 - 2	No GDWL
Lowell Recycling Club	5	Lowell High School 25th Ave. & Eucalyptus	3rd Saturday only 8:30 - 12:00 noon	No CDBD or GDWL
American Youth Hostel	9	Mission High School 18th St. & Church	2nd Saturday only 8:30 - 12:00 noon	No CDBD or GDWL
A.M., F.M. Recycling	4	Fort Mason, Bldg. A	Saturdays, 9 - 2	No CDBD or GDWL
Richmond Environment Action	4	Haight & Octavia	Six days a week	No CDBD
Bernal Recycling	1	Farmers' Market 100 Alemany Blvd.	Every Saturday 9 - 2	No GDWL

100L?

COMPANIES THAT PAY FOR RECYCLABLES UPON DELIVERY

Call For Current Prices And Preparation InstructionsAluminum Cans

Reynolds Aluminum, 467-9798
401 Tunnel Ave., Brisbane
M-S; 9 - 4:30

16th and Bryant, Mobile Unit
T - S, 10 - 3

Golden Brands, 863-4669
255 Channel
M-F; 10 - 12

Bracco Distributing, 957-9900
175 Townsend
T&TH Only, 11 - 2

Glass Containers, bottles and jars

Brockway Glass, 632-7250
8717 G Street, Oakland
T, Th, Sat, Only, 8:30 - 2:45

Owens Illinois, 436-2190
3600 Alameda, Oakland
F&S Only, 7 - 3

Glass Container, 581-5025
22302 Hathaway St., Hayward
T&Th Only, 9 - 12

Paper

Independent Paper Stock, 621-6200
350 Rhode Island
M-F, 8 - 8:30; S, 8 - 11
All Grades

C.R.S. - Paper Recycling Division,
957-9599
135 King
M-F, 8 - 3, No cardboard

Engineered Waste, 282-7171
901 Minnesota
M-F, 7:00 - 4:00
No news or cardboard

Bayshore Salvage, 467-0567
600 Tunnel Avenue
M-F, 8 - 3
News, cardboard, computer only

Consolidated Fibers, 285-3520
998 Indiana
M-F, 7:30 - 3
No news or cardboard

COMPANIES THAT OPERATE COMMERCIAL COLLECTION PROGRAMS

Call For Current Prices And Minimum Amounts

Aluminum Cans

Reynolds Aluminum
Hayward, 785-9565

Glass Containers, Bottles & Jars

Circo
Hayward, 562-0100

Paper

Independent Paper Stock	621-6200
Wastepaper	431-9797
Paper Cycle	282-7171
Weyerhaeuser Company	821-0900
Bayshore Salvage	467-0567
Consolidated Fibers	285-3520
CRS-Paper Recycling Division	957-9599

Tallow, Grease, Suet, Bones

Del Monte Rendering	647-4541
Royal Tallow & Soap	647-4890

Waste Oil

Eko Tek, Oakland	(800) 772-3372
Liquid Gold, Oakland	635-5626
All American Waste Oil, Pleasanton	836-6517
Allied Oil & Pumping, Mountain View	966-6588
Alviso Oil Co., Alviso	262-2715
I.T. Oil Co., Martinez	228-5334

NOTE:

Service stations will usually accept oil from the public. It is collected by one of the above companies and either re-refined or used as a fuel or for dust control.

"FISS"™

"FULLY INTEGRATED SOURCE SEPARATION"

A
LOW-TECHNOLOGY
SOLID WASTE MANAGEMENT
METHOD

BY:



P. O. Box 77

Unionville, PA., 19375

(215) 793-1840

1980 GTA, Inc.

The "FISS" Approach

Source separation systems utilize either a curbside pick-up or a participant delivery of recyclables to a collection center (Figure 1) but rarely a combination of the two methods. Of 191 source separation programs operating in New England in 1977, 14% were curbside pick-up and the remaining 86% were participant delivery.

Curbside pick-up of recyclable materials results in increased capital and O & M costs. Trucks having divided bodies or tag-a-long trailers may be required or the standard packer truck may make several trips over the same routing to pick-up the recyclables. Either of these methods increase costs of the source separation program but the curbside pick-up method does have a distinct advantage, specifically, a relatively high participation rate.

Participant delivery of recyclables to a collection or recycling center has a lower operating cost but, unfortunately, also a lower participation rate.

GTA, Inc. has developed a method that combines these two methods of acquiring recyclables without the disadvantages of either (Figure 2). The method utilizes the standard trash pick-up service using the normal schedule and collection vehicle for those persons having curbside collection of waste. Persons normally delivering their wastes to the landfill will deliver their recyclables.

Newspapers, when discarded are usually in the form of a pile, not single issues. This pile can be tied, placed in a paper bag, or just placed with the other waste awaiting pick-up. The collection vehicle can be fitted with racks (the preferred method) into which the paper can be placed or the bundles or piles can be deposited directly in one side of the main body. When the load is discharged at the landfill working face, the load is loosened with a loader and the paper removed by pickers if the paper has been placed in the main compactor body. The recovery rate is slightly less with this approach but no special preparation of the paper for pick-up is required. Trucks equipped with racks can empty these racks directly into the paper containers at the landfill.

Cans (aluminum and "tin") and glass are recovered by using a distinctive

SOURCE SEPARATION & WASTE DISPOSAL

-Traditional Relationship-

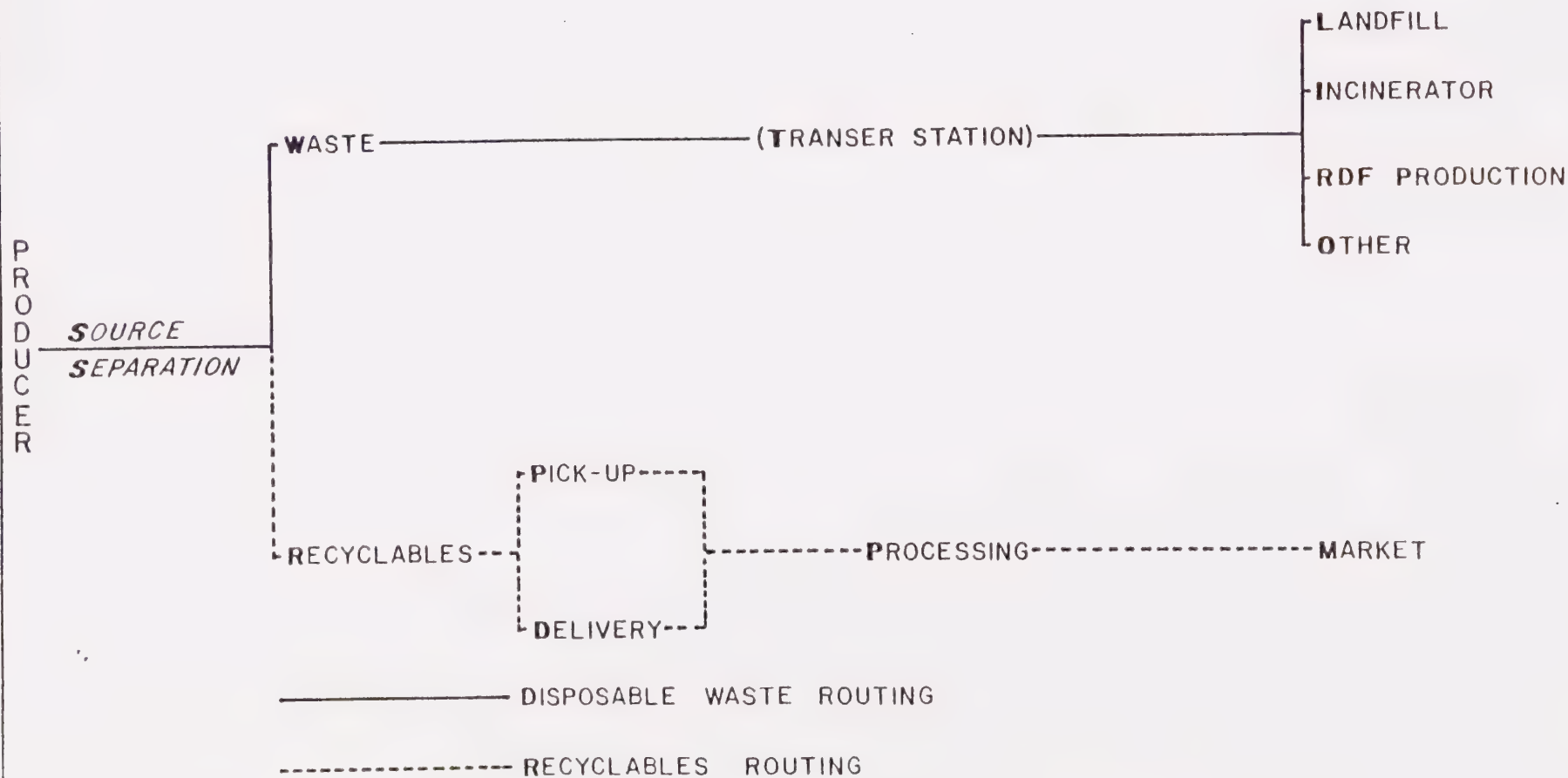


FIGURE 1

SOURCE SEPARATION & WASTE DISPOSAL

-The "FISS"TM Approach-

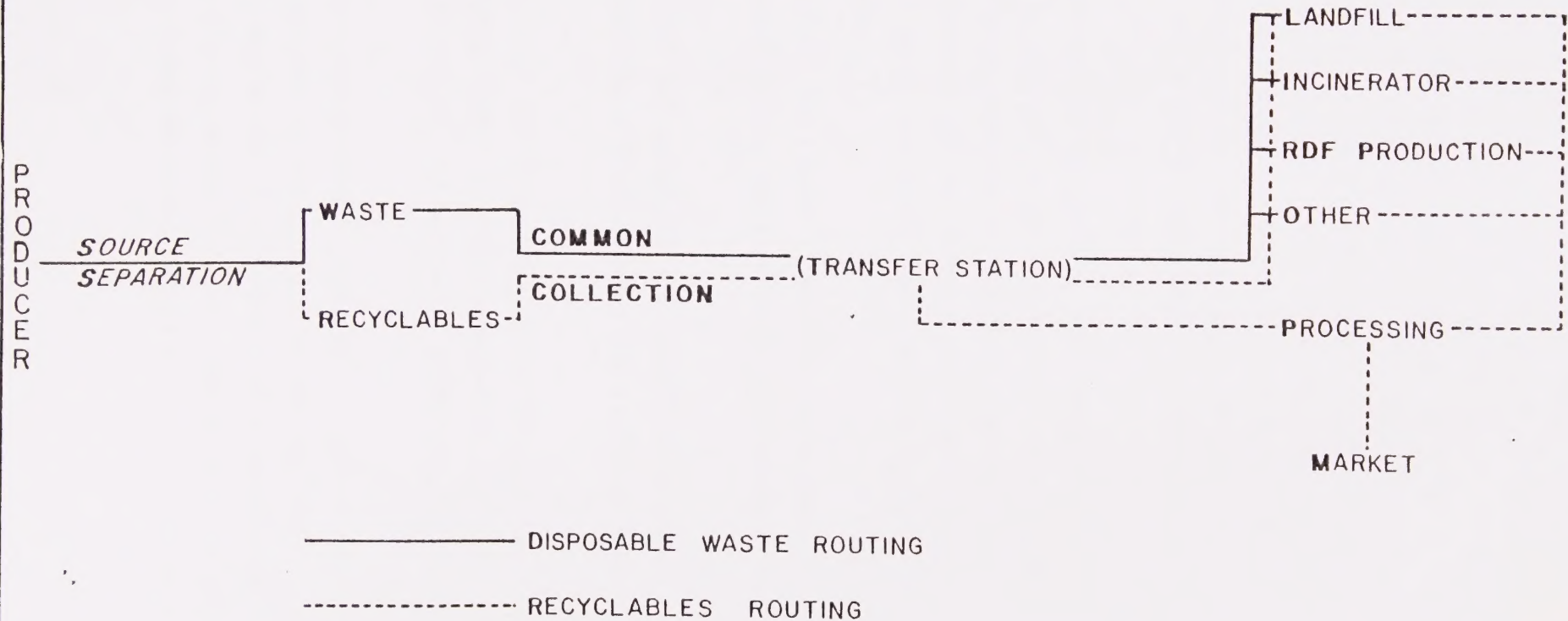


FIGURE 2

container for them. Bags of colors not normally used as "garbage bags" are used. Cans and clear glass are placed in one color bag while cans and colored glass are placed in a different colored bag if glass is to be color sorted, otherwise, a single, colored bag may be used. These bags are placed at the curb and picked up and placed on one side of the compacting unit during the regular service cycle. When the collection vehicle discharges at the landfill, pickers can readily identify and locate the bags containing recyclables by their color and location and remove them from the load without going through the whole load. A small percentage of the material may be lost due to bag breakage or misplacement within the load but a sufficient amount is recovered to justify the method.

The paper and the bags containing the recyclables are then processed either at the landfill or at a regional processing center. The glass is crushed, the colors being kept separate if required, and the cans magnetically separated into ferrous and non-ferrous fractions. The equipment to accomplish these tasks is readily available at costs ranging from \$2,500 to \$30,000.

People delivering their wastes to the landfill, deposit their bags, by color, and paper, in the appropriate containers for subsequent processing.

Those materials to be landfilled are spread on the working face after the load has been picked, compacted, and covered as per standard operational procedures.

Preliminary studies have indicated that 2 men can strip the load discharged by a 22 cubic yard packer truck of paper, cardboard, and bags of recyclables in less than 15 minutes, if the recyclables are placed on one side of the load.

The "FISS"TM method, in effect, does away with separate collection and its attendant costs and the delivery of recyclables by persons not normally delivering their own wastes and should result in a relatively high participation rate. It also turns the landfill into a recyclables collection point and, if the volume warrants, into a processing center.



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Handwritten notes at top right, possibly "M... State 7/10/55".

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Large handwritten notes in the center, including "SMB" and "Phony bk".

Handwritten notes at bottom right, including "G.B.H." and "M...".